

## HUMAN BRAIN MAPPING AT THE SINGLE CELL AND FIBER LEVEL

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A newly developed strategy for the study of the 3-D geometry of dendritic ramifications and fiber distribution at the microscopic level will be presented (Belichenko & Dahlström, Human Brain Mapping, 1994, 1:185-193). Examples of applications will be presented with results from 6 control autopsy cases compared with 1) biopsy material from the epileptogenic zone of 15 patients with therapy resistant partial epilepsy (TRPE), undergoing epilepsy surgery, 2) autopsy material from 4 patients with Rett's syndrome, and 3) one autistic case. We observed different types of dendritic abnormalities in these diseases compared to control (Belichenko et al., Epilepsy Res., 1994, 18:233-247; NeuroReport, 1994, 5:1509-1513). In TRPE cases the dendritic abnormalities were observed on neurons in epileptogenic cortex located laminae I, II, III and V, and in the subcortical white matter. Many pyramidal cells had 2 or 3 dendrites originating from the apex, instead of the normal single apical dendrite. In cases of Rett's syndrome the results show somewhat different types of dendritic abnormalities as compared with TRPE and control cases. The normally developed specialization in pyramidal cell architecture in different cortical areas were not observed in Rett cases. No microdysgenesis was observed in contrast to TRPE cases, where microdysgenesis was frequently seen.

These results will be discussed in correlation with etiology, with different types of pharmacological approaches, and with clinical and neurophysiological data.

Supported by the Swedish MRC (12V-10808, 14X-2207), The Royal Swedish Academy of Science in Stockholm, and from International Science Foundation (no. 33000).